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ECDIS Display, Safety Settings and Alarm Management

Capt Zakirul Bhuiyan  MSc, PGCE, AFNI, AFRIN
Senior Lecturer
Warsash Maritime Academy
Why ECDIS?

(Electronic Chart Display and Information System)

Safety

“The primary function of ECDIS is to contribute to safe navigation.” IMO, 1995.
ECDIS Display, Safety Settings and Alarm Management

Contents

1. Display information on ECDIS.
2. The importance of Safety Settings.
3. The chart scale in use – the significance of ‘compilation scale’.
4. The cells used on the ECDIS to display and the features of those cells, e.g. Scamin
5. The need to keep ECDIS software updated
6. Alarm management on ECDIS
1. Display information on ECDIS.
Display Information

- Chart objects and information available for display are contained in IMO Performance Standards and divided into:
  - Base
  - Standard
  - All other Information
- “Base” and “Standard” displays should look the same
- It is possible for a user to select too much or too little information on the display
- Display setup will vary depending on a variety of factors
Display Standards

• Display Base

  - Minimum set of information which must always be displayed and cannot be removed
Display Standards

- Standard Display
  - The information contained in the display base and most of the detail needed for safe navigation.

What is about soundings?
Display Standards

- All Other Information
  - It is to be displayed individually on demand
Custom Display
as per manufacturer
Contents

2. The importance of Safety Settings on ECDIS
Safety settings:

Appropriate safety settings are of paramount importance for the safe navigation:

- **Safety depth**: Normally ship’s draft + Squat

- **Safety Contour**: The division between safe and unsafe water. (Basically Ship’s draft + Squat + UKC – Ht of tide)

- **Deep Contour**: To indicate the area in which the depth of water is such that own ship may experience squat. Normally twice ship’s draft.

- **Shallow Contour**: To highlight the gradient of the seabed adjacent to the safety contour. It should be next contour shallower than Safety Contour.

- **Underwater obstn / isolated danger**: The display of isolated dangers changes according to the safety contour.
Calculating Safety Settings
An Example

Draught +6.0m
Squat @ 10Kts +1.0m
Safety/Extra UKC +2.0m
Height of Tide -2.0m
Safety Contour 7.0m

• Remember to consider the CATZOC while calculating Safety Settings.

• CATZOC (“Category of Zone of Confidence” in six categories) in an ENC gives an estimate of the reliability in the source data.
Safety Settings

Safety Contour marks the boundary between safe and unsafe water.

Deep Contour indicates the area where own ship may experience Squat.

Safety depth affects the display of soundings. Here 7m or less appear in black.

Shallow Contour highlights the gradient of the seabed.
Failure to manage display layers has resulted in grounding incidents in recent years – Pride of Canterbury

Safety Contour 10m
No apparent danger
Pride of Canterbury

Isolated danger displayed when Safety Contour is changed to 5m
Pride of Canterbury

When ‘All Other Information’ Display is used

1.8 m
LT Cortesia
LT Cortesia

Default safety settings to 30m
LT Cortesia

After appropriate settings (Draft 12m)
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3. The Chart Scale in Use
Compilation Scale
Under-scale and Over-scale
4. The cells used on the ECDIS to display and the features of those cells
SCAMIN

• Scale Minimum

• Reduces clutter when zoomed out
• Safety critical information may be removed
Scamin attributes available
What is the difference?

So, Always check plans at Compilation Scale before use
The depth contours may differ between electronic charts produced by different hydrographic offices.
Time varying Objects

Special buoys are only shown during March to October
5. The need to keep ECDIS software updated
ECDIS Software upgrade

• If ECDIS software is not upgraded to read latest version of the ENC Specification or to use the latest version of the S-52 Presentation Library (3.4), then there could be:
  ▪ A failure to display a navigational feature correctly
  ▪ A failure to activate alarm correctly
  ▪ A failure to manage a number of alarms correctly

In this case, it may display question mark mark (?)
This ? Mark symbol means

- No symbol in ECDIS ? – Older software (Newer software will display “New Object” symbols)
- Data missing from object ? (Direction/colour etc)
- Low accuracy data ?

- IHO has recently provided a ‘check data’ to help mariners to identify if their particular ECDIS is able to display all the latest IMO features
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6. Alarm management
ECDIS alarm management

It is very critical as

- it could vary from manufacturer to manufacturer
- the level of control over alarms may vary from being very detailed control to minimal control
- some manufacturers allow the mandatory alarms to be disabled
- some even allow choice of chart scale for alarm check
Safety Frame

As large as possible as the circumstances allow”
Important

• Not all dangers are enclosed by a contour

• Guard Zone / Safety Frame still active if not displayed

• User MUST know which alarms are disabled

• Guard Zone should be set:

  “As large as possible, as small as necessary”
Integrity Monitoring Techniques

Cross check by all available means:

- look out of the window
- manual position fixing (Visual/Radar)
- comparison of Radar/ARPA overlays
- observation of a parallel index on the radar
- monitoring the depth shown by echo sounder
- checking the track history
- change sensor if available
GPS Error
Gyro Error
Conclusion

- Navigators should not over-reliance on ECDIS
- Always cross check ECDIS information with other sources
- A visual lookout is very important as ‘human eyes are the most valuable tool at a navigator’s disposal’
- ECDIS is a valuable asset for navigators - more time to maintain a proper lookout with detailed situational awareness
- ECDIS may ‘contribute to accidents’ rather than preventing them until used accurately and properly.
Any Questions?
THANK YOU